

OCULAR TRAUMA

First exclude

- Life threatening conditions
- Disability
- Orbital & skull base fractures
- Globe injuries

Chemical Burn

Only eye injury that requires
immediate TTT B4 HX &
careful **OX**

Immediate management

B4 HX & OX

- Copious **irrigation** with ?!!!! for 30 minutes until ...pH.
- **Double eversion...** remove particulate
- **Debridement** of necrotic epithelium
- **Clean water** can be used (TIME IS MORE IMPORTANT THAN TYPE OF SOLUTION)



Acid		
Substance	Chemical Composition	Found in
Sulfuric acid	H_2SO_4	Car batteries
Sulfurous acid	H_2SO_3	Bleach and refrigerant
Hydrofluoric acid	HF	Glass polishing and mineral refining
Acetic Acid	CH_3COOH	Vinegar, glacial acetic acid
Hydrochloric acid	HCl	Swimming pools

Alkali		
Substance	Chemical Composition	Found in
Ammonia	NH_3	Cleaning agents, fertilizers, refrigerants
Potassium Hydroxide	KOH	Caustic potash
Lye	NaOH	Drain cleaners, airbags
Magnesium Hydroxide	$Mg(OH)_2$	Firework sparklers, flares
Lime	$Ca(OH)_2$	Plaster, mortar, cement, white wash

Chemical trauma

- **Alkali and acid burns**
- **Cement and Lyme:** NEVER WASHED
- **Tear gases:** cause marked lacrimation, burning and blepharospasm, near injuries may damage the cornea
- **Sulfur Mustard:** used in chemical warfare, causes skin blistering, respiratory problems and severe keratoconjunctivitis with corneal ulceration, opacification and vascularization

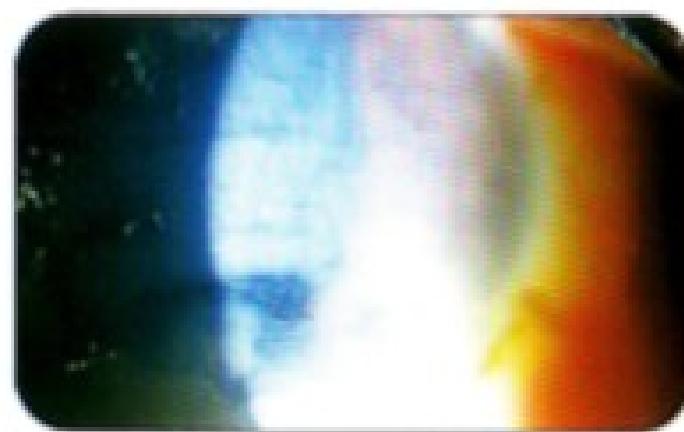
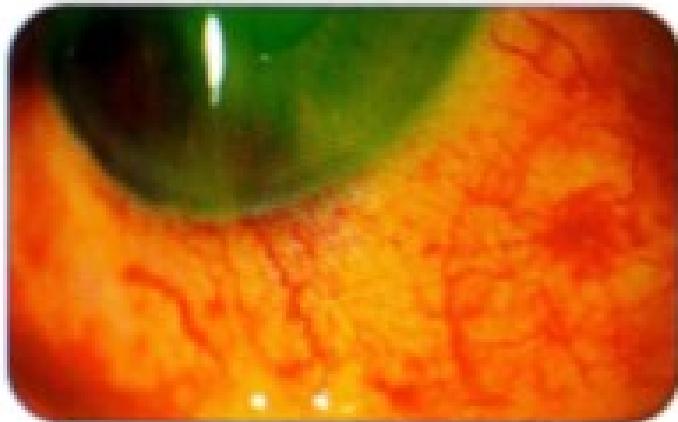
Grading

❑ According to :

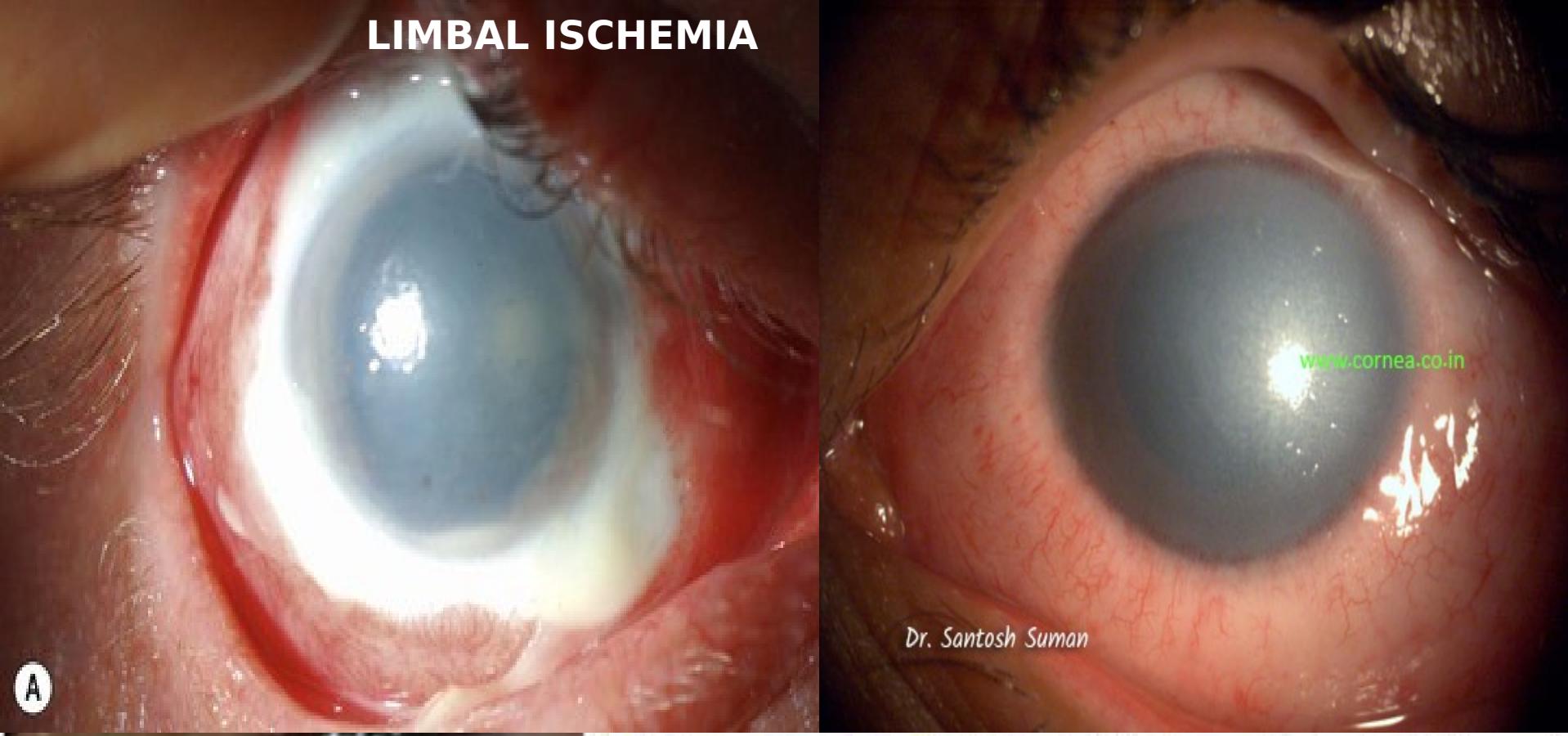
- **Clarity of the cornea** (**iris visibility**)
- **Limbal ischaemia**

Hugh's classifications of chemical injury:

grade	signs	prognosis
I	<ul style="list-style-type: none">▪Corneal epith. damage▪No limbal ischemia	Excellent
II	<ul style="list-style-type: none">▪Corneal haze but iris details seen▪Ischemia less than 1/3 of limbus	Good
III	<ul style="list-style-type: none">▪Corneal haze but iris details hazy▪Ischemia <1/3 of limbus	Fair
IV	<ul style="list-style-type: none">▪Opaque cornea▪Ischemia >1/2 of limbus	Poor

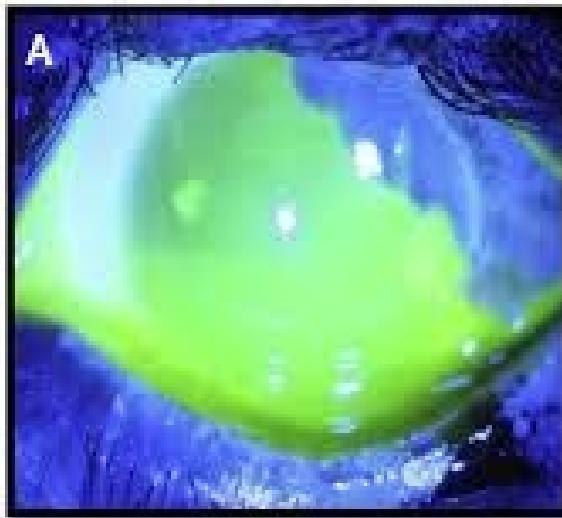


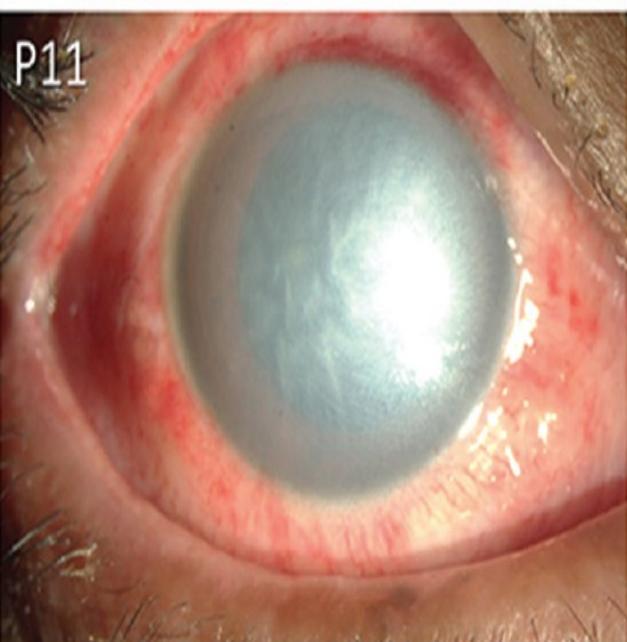
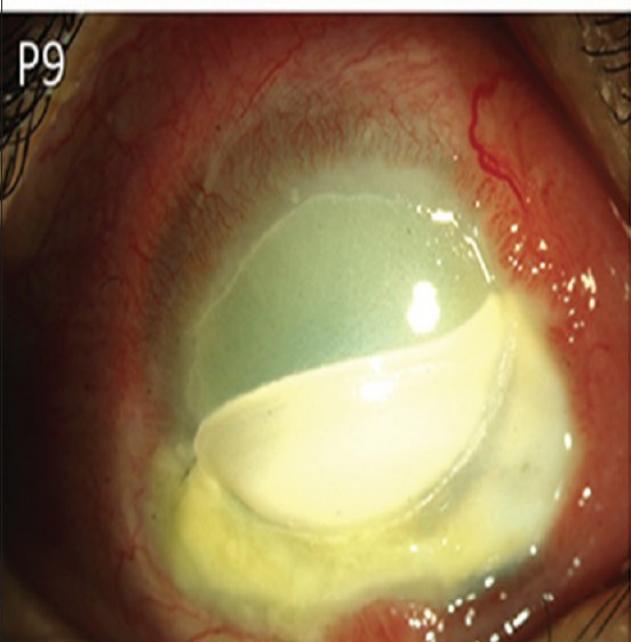
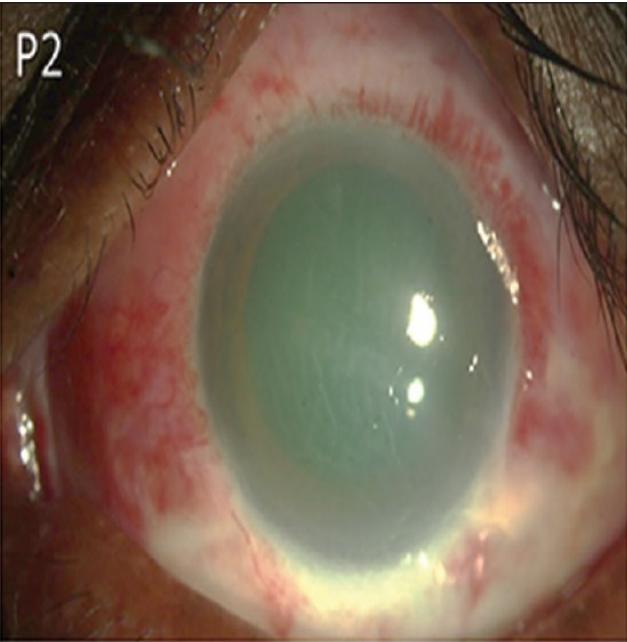
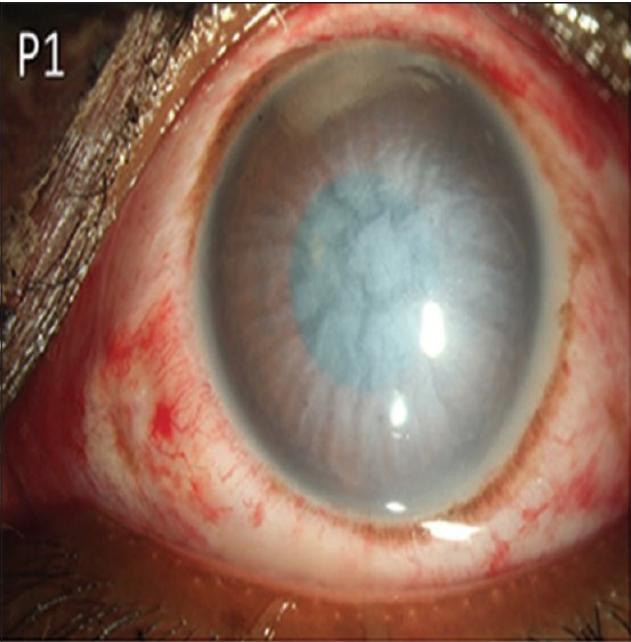
LIMBAL ISCHEMIA



Dr. Santosh Suman

A





Manage

I - II

Medical for 1 wk:

- Topical steroids & cycloplegics for 7-10 days
- then NSAIDS
- Topical AB ointments
- Topical & syst. Ascorbic, citric & tetracycline

III - IV

Medical

Surgical:

- Early
- Late

Aim:

- Decrease inflamm.
- Prevent ulceration
- Simulate regeneration

Surgical

Early

❑ Aim:

- Revascularization
- Restore LSC Limbal Stem Cell
- Re-establish fornices

- Tenon advancement
- AMT(amniotic membrane transplantation)
- LSCT(limbal stem cells transplantation)
- If perforation:
 - Glue
 - Patch graft

Late

□ Conj:

Division of bands & symblepharon

Lid:

Correction of deformities

□ Cornea:

- **PKP** (penetrating keratoplasty)....When?
6 months
- Keratoprosthesis



Eye injury

Closed globe
No full thickness wound

contusion

Lamellar laceration

Open globe
Full thickness wound

**Laceration
Sharp object**

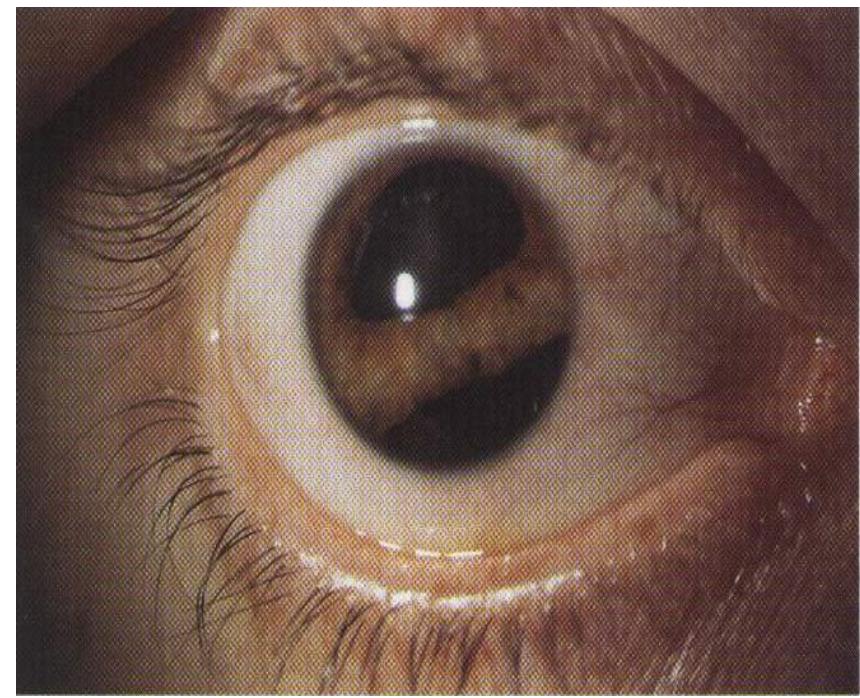
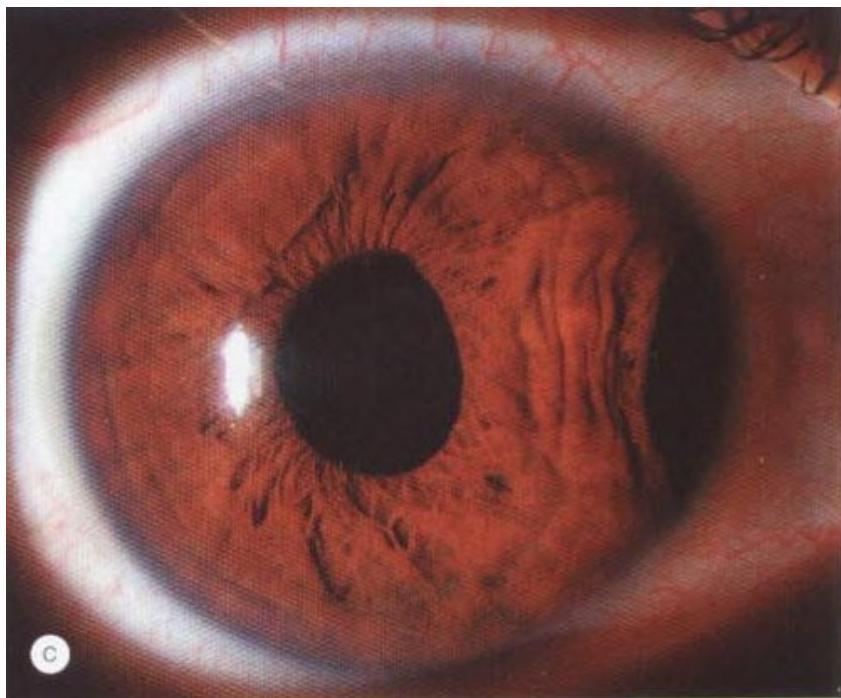
Penetr.
Entrance
wound

IOFB

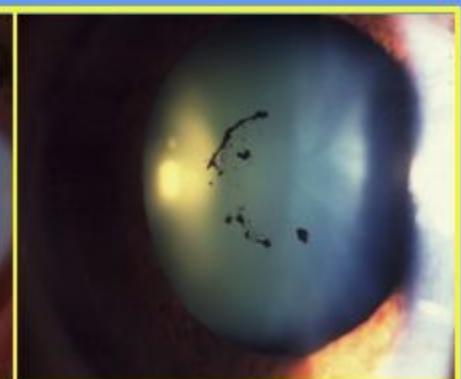
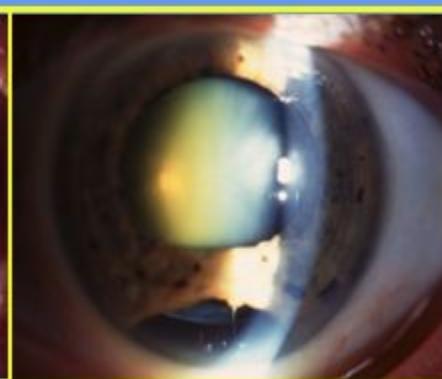
Perforat.
Entrance & exit
wound

**Rupture
Blunt object**

Iridodialysis



Anterior segment complications of blunt trauma

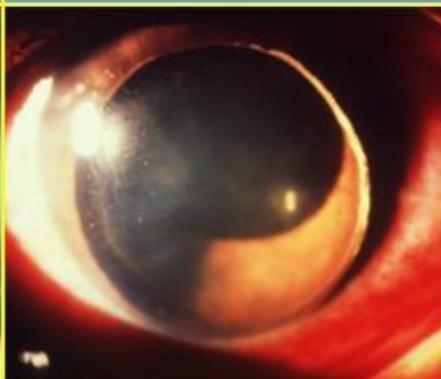


Hyphaema

Sphincter tear

Iridodialysis

Vossius ring



Cataract

Lens subluxation

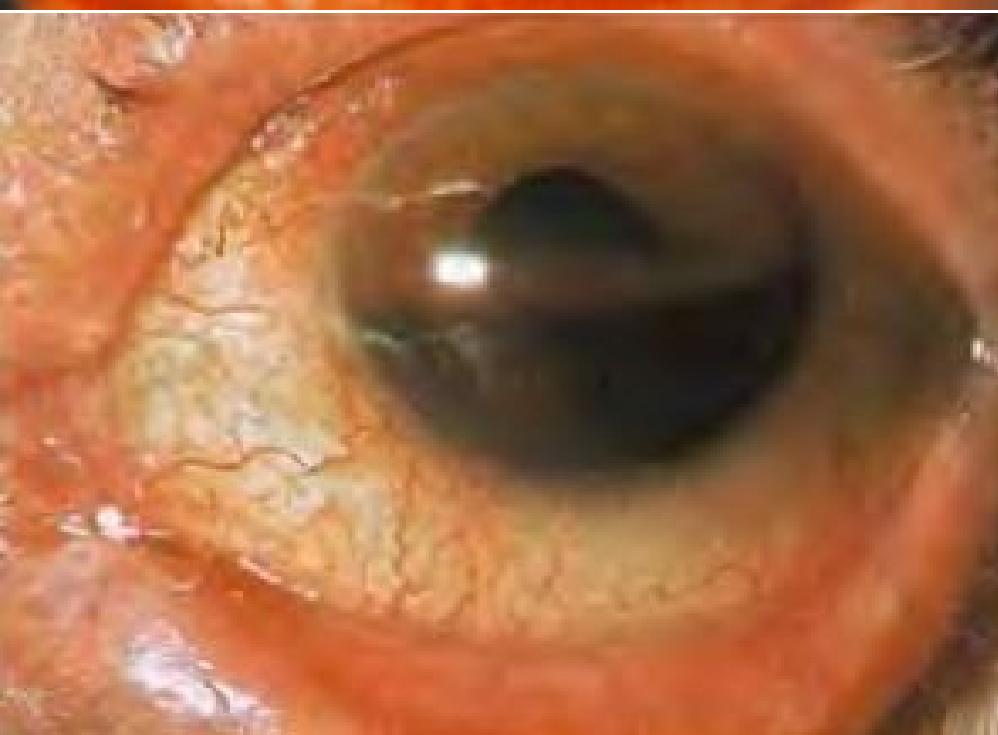
Angle recession

Rupture of globe

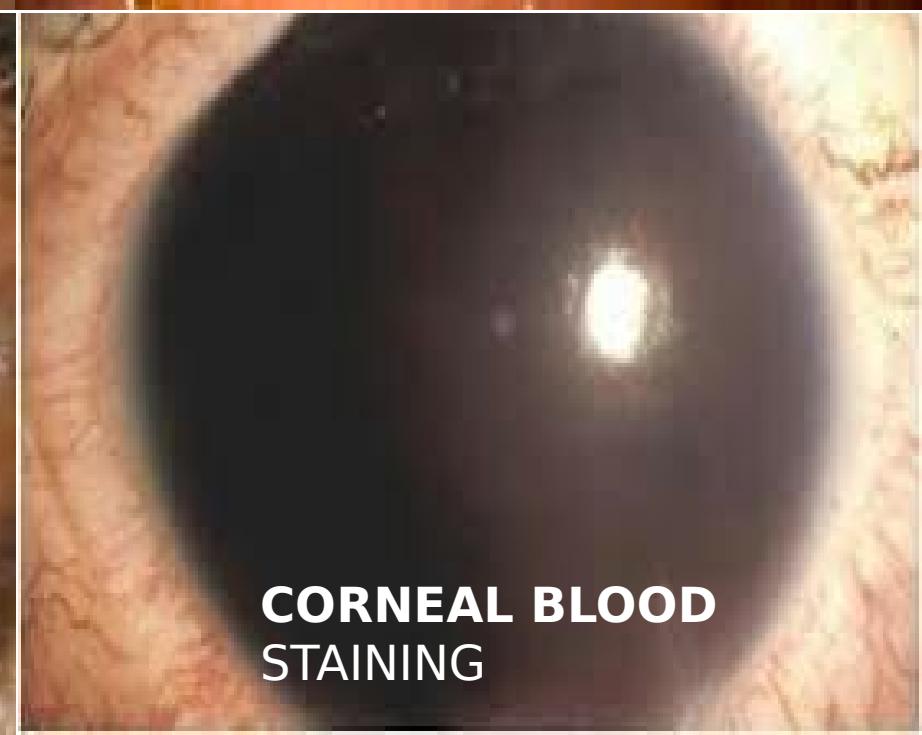
MODERATE HYPHEMA



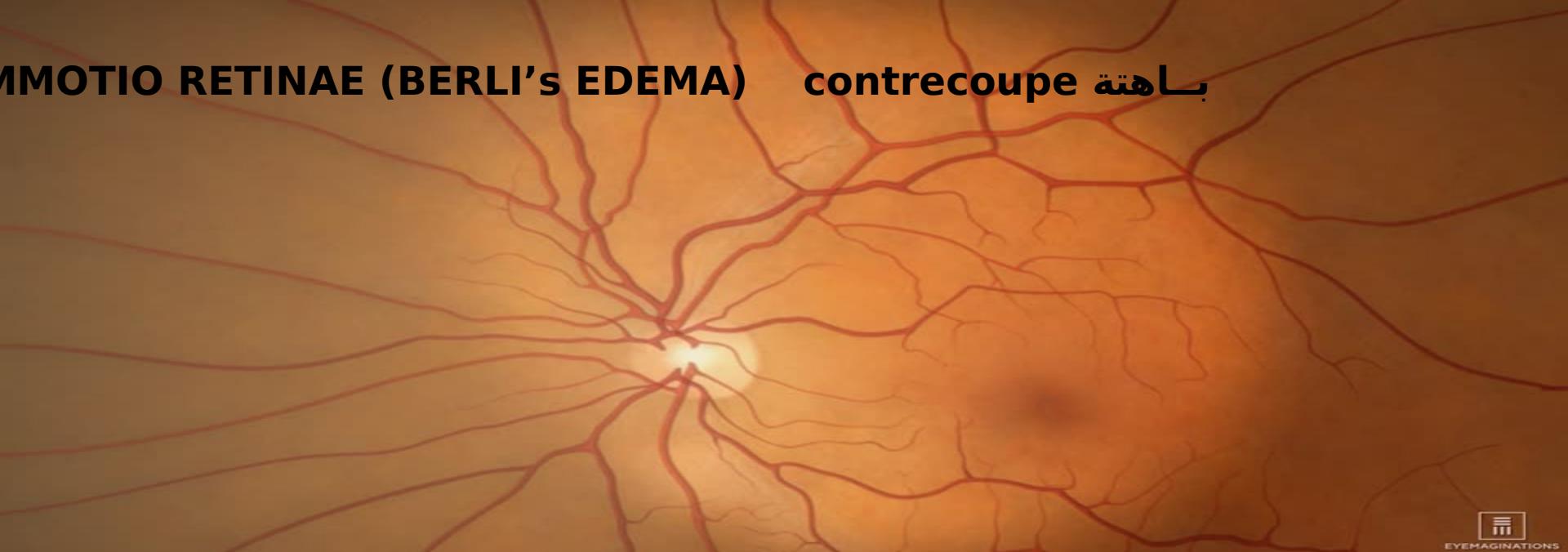
SEVERE HYPHEMA



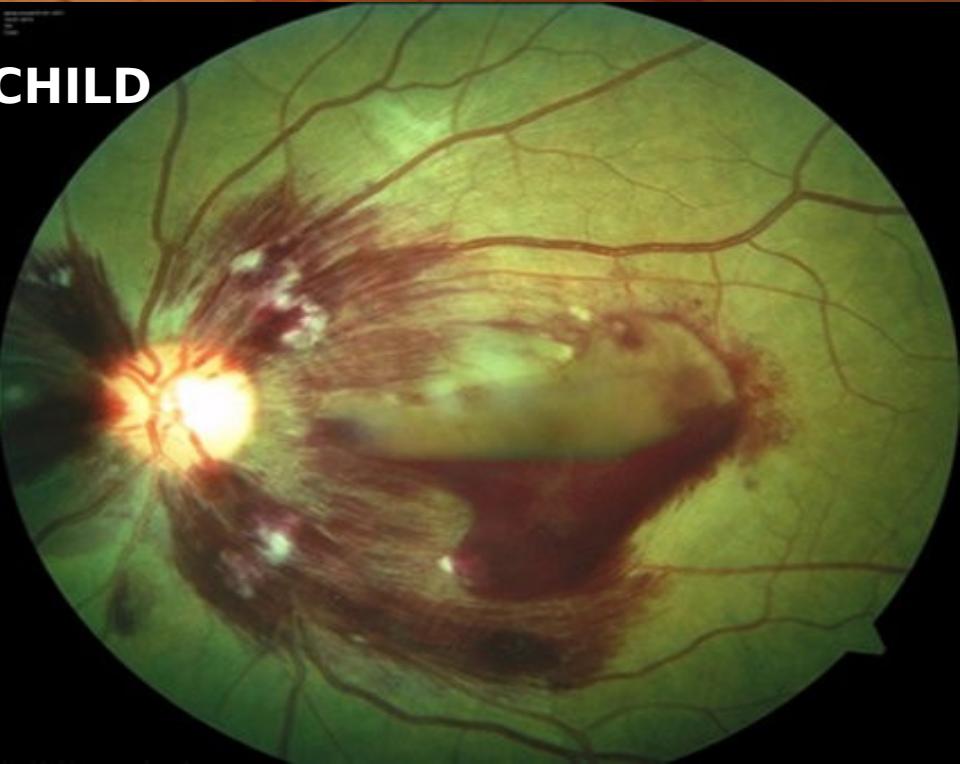
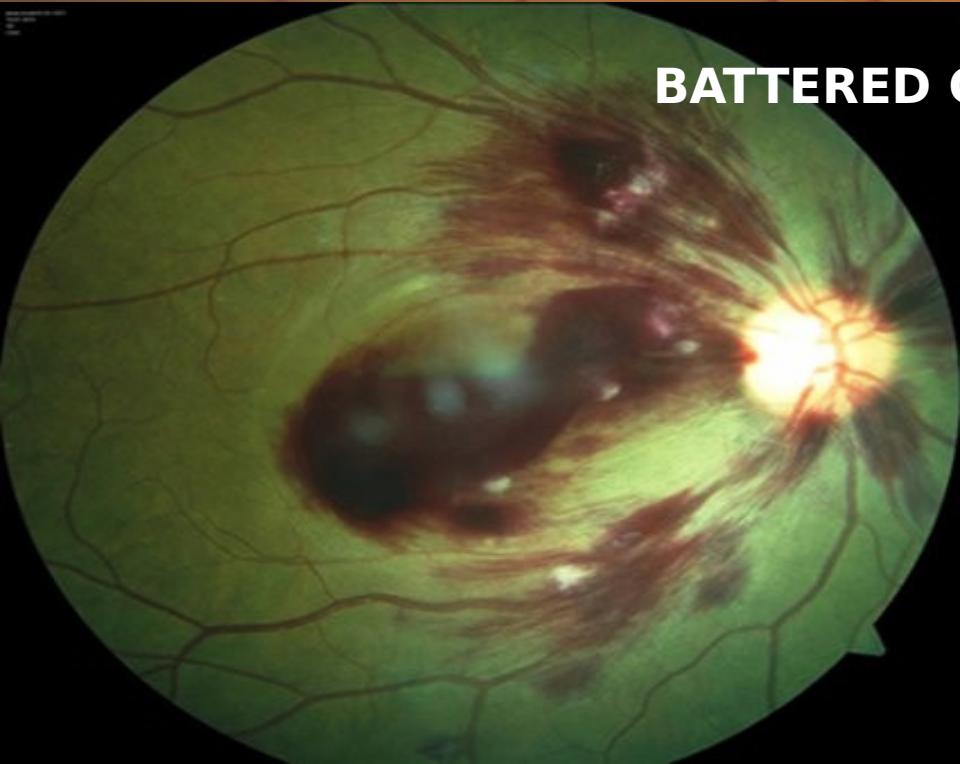
**CORNEAL BLOOD
STAINING**

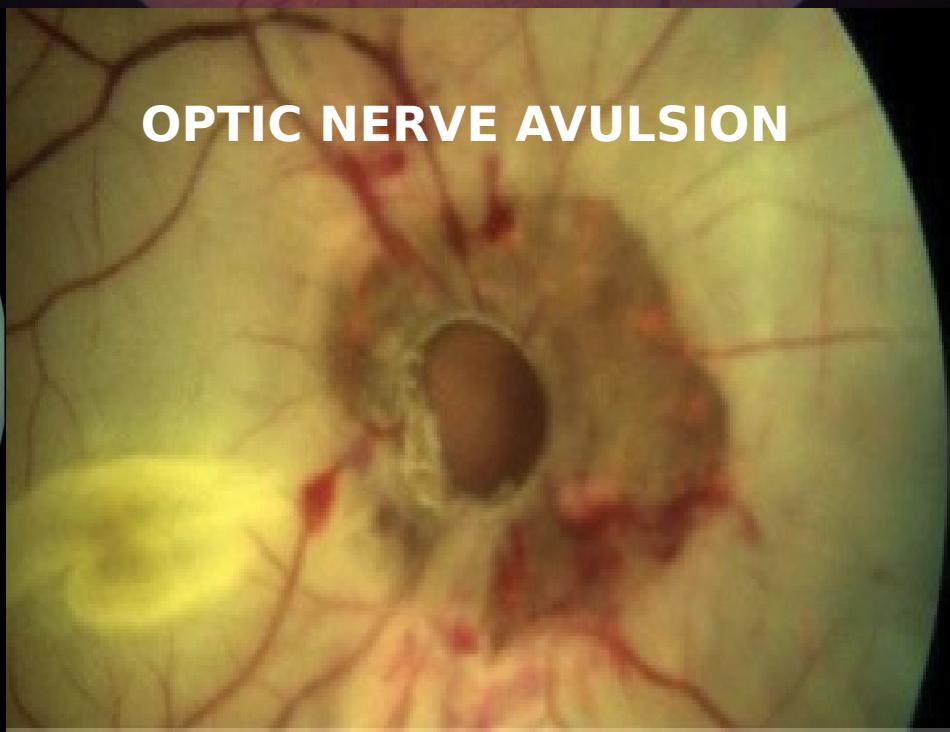
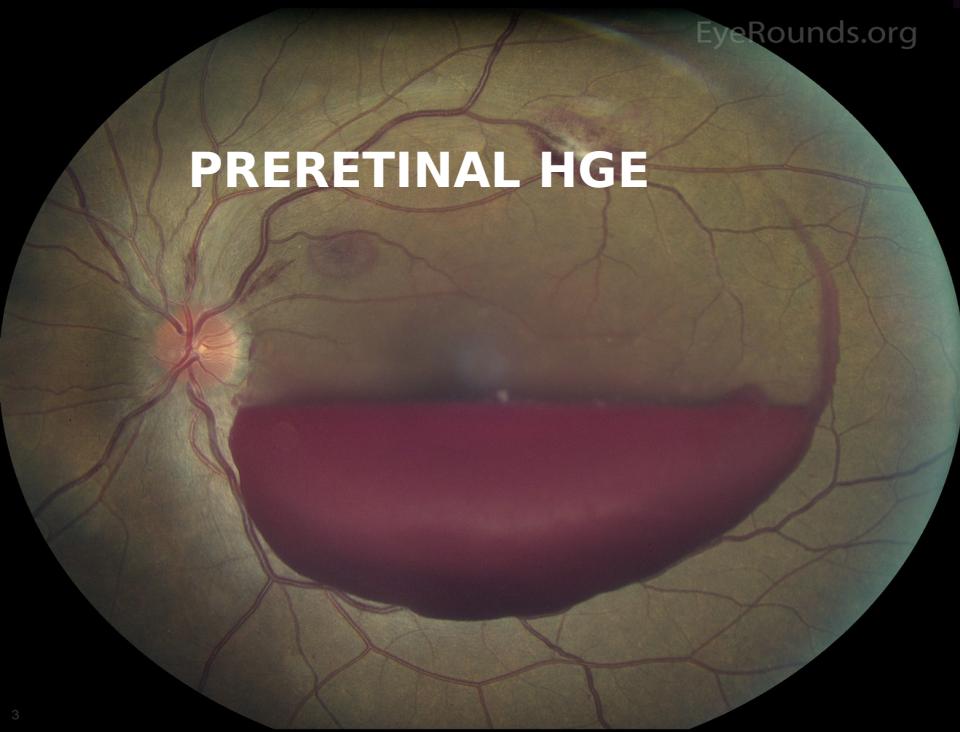
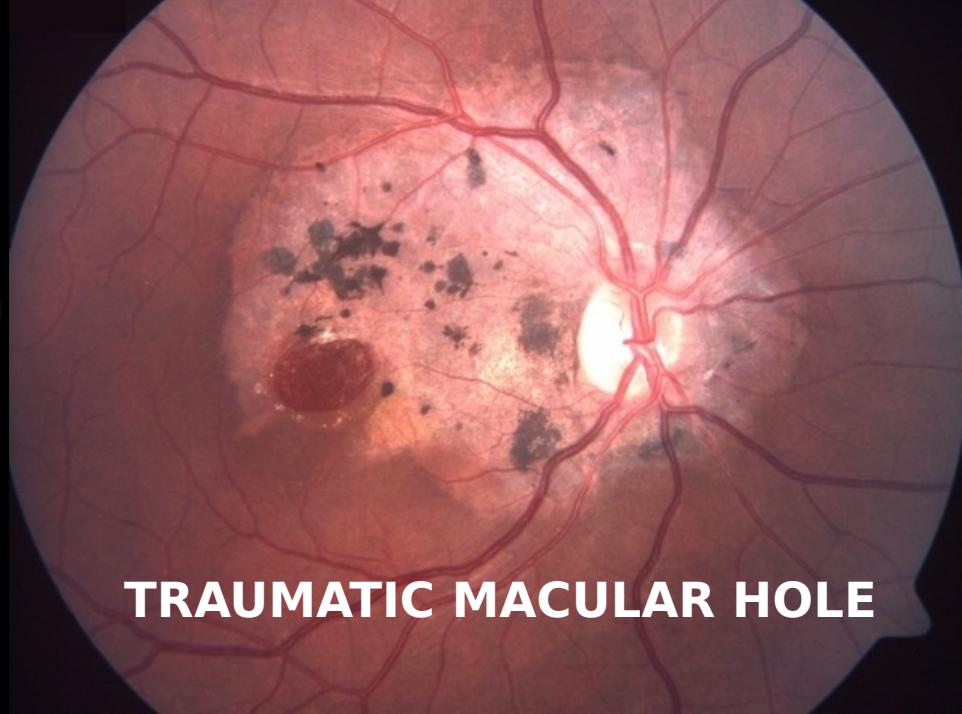
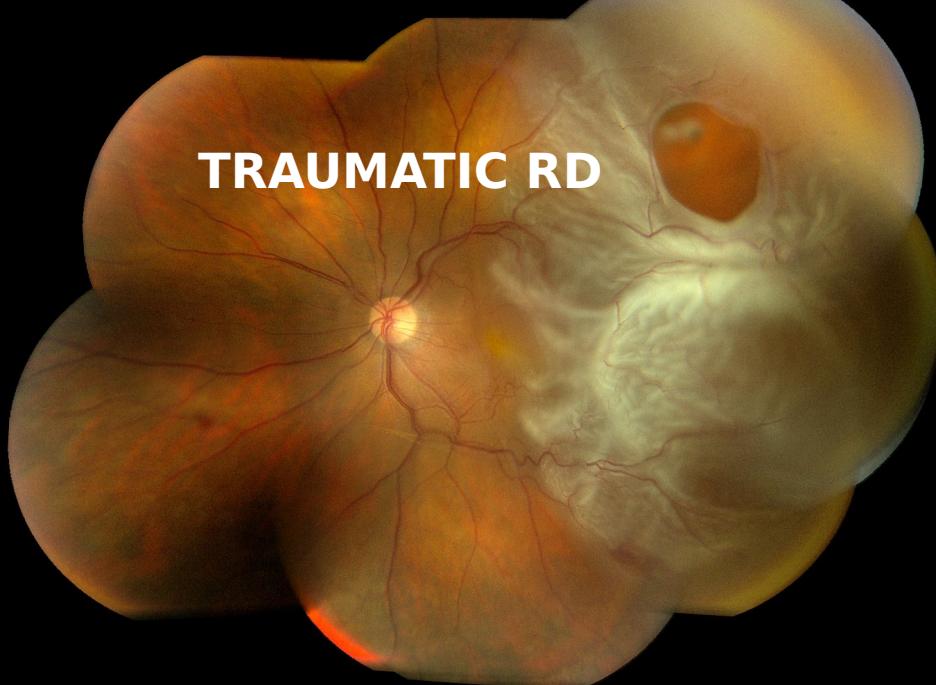


IMMOTIO RETINAE (BERLI's EDEMA) contre coupة باهنة



BATTERED CHILD

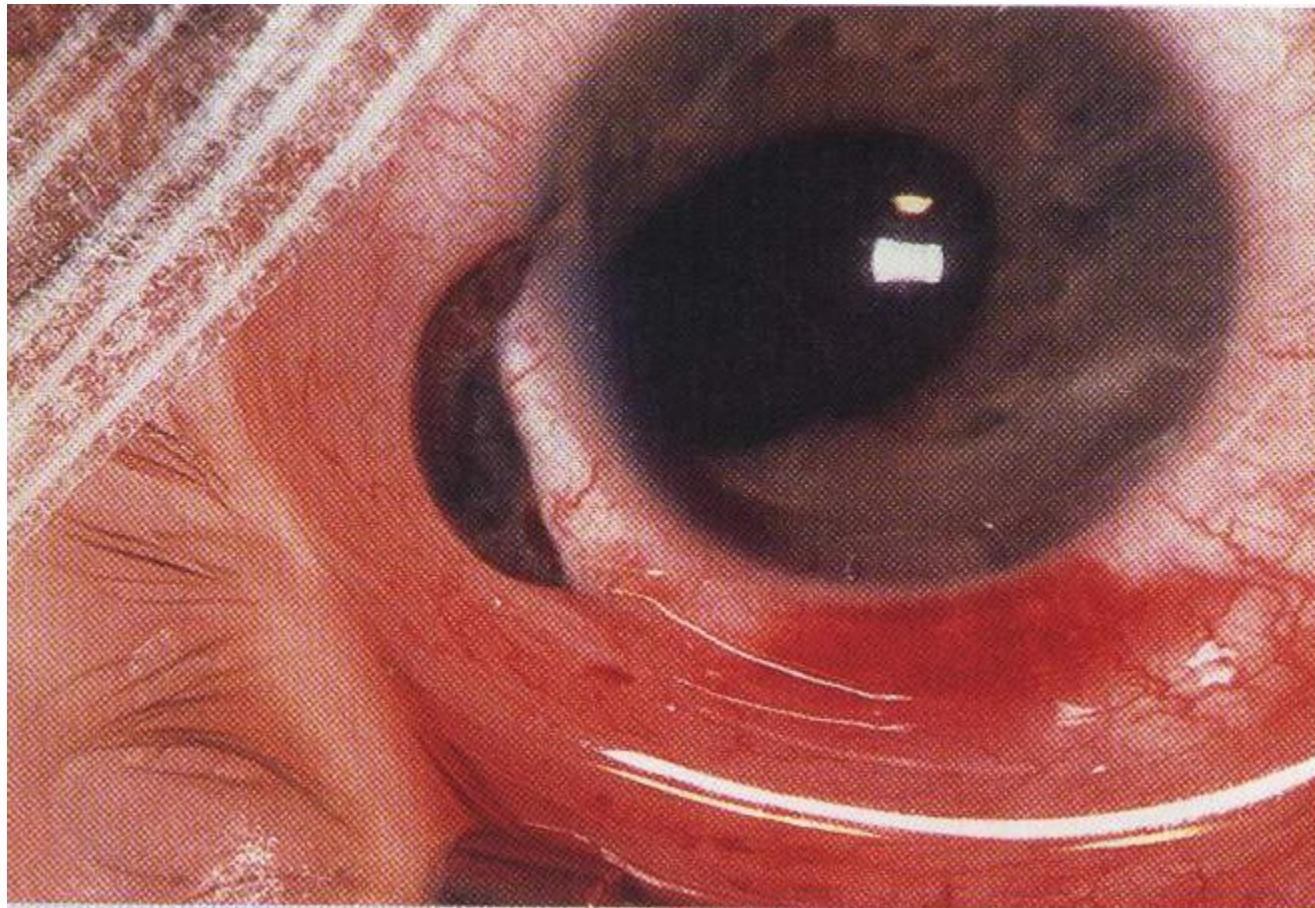




Car Accident

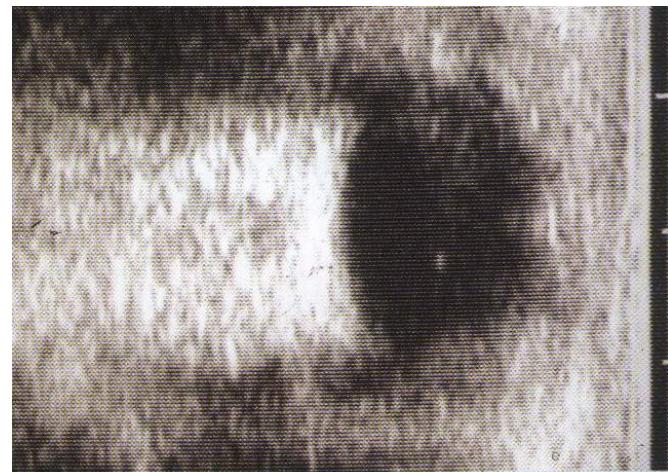
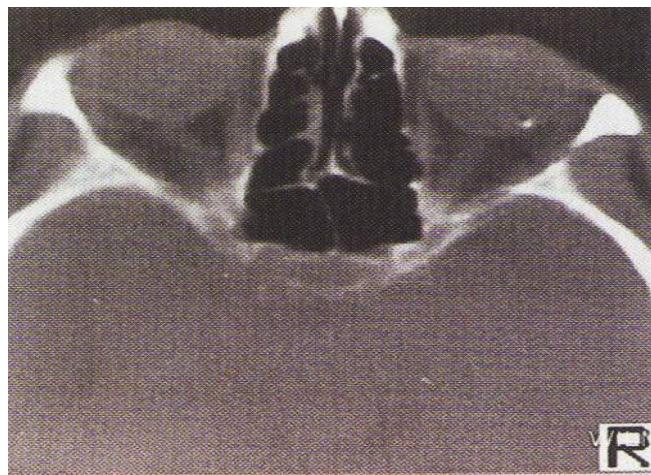
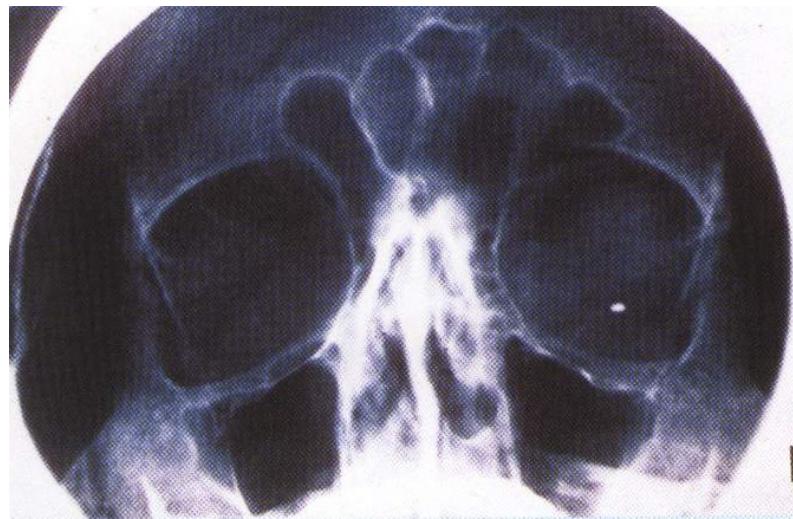


Scleral laceration with iridociliary prolapse



Penetrating corneal wound with iris prolapse

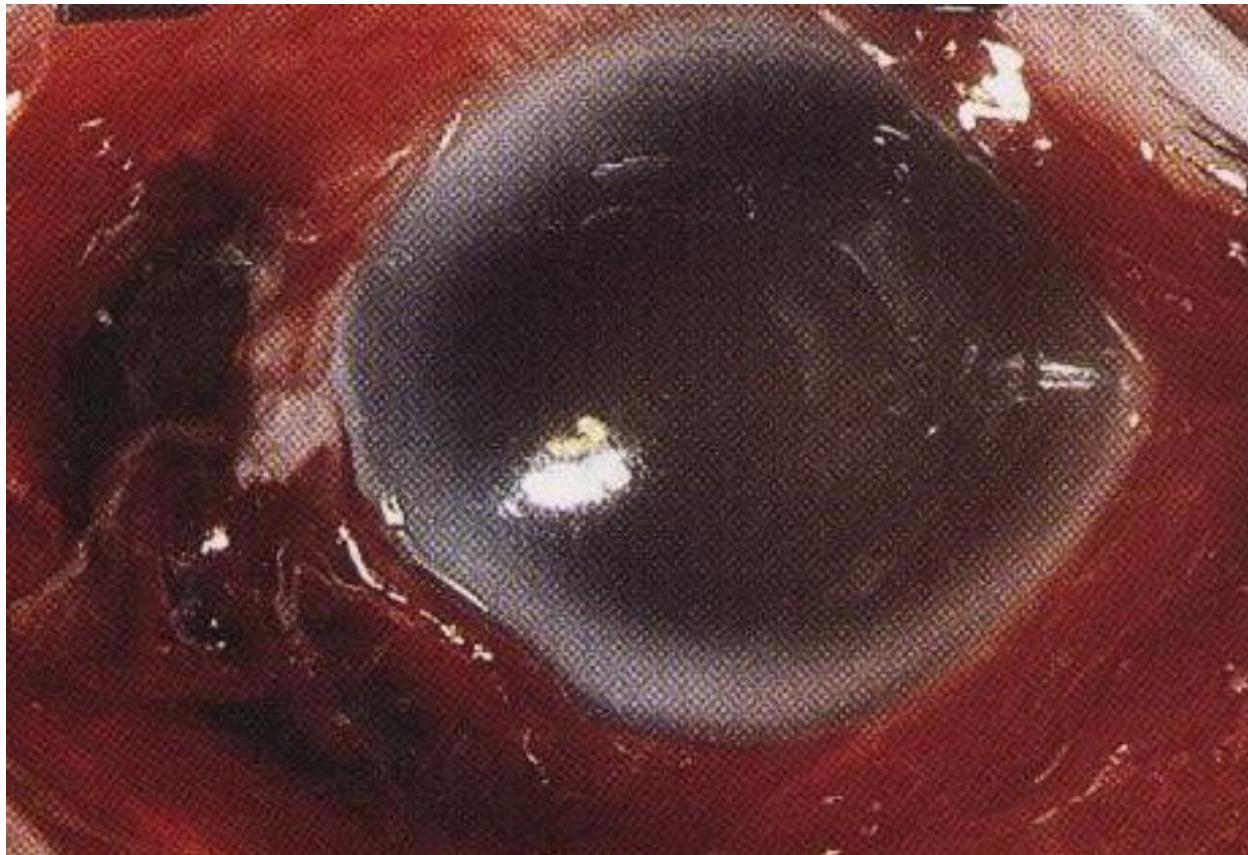




Corneal laceration with **cataract**



Rupture globe



Trauma case management

First exclude

- Lifethreatening conditions
- Globe injury
- IOFB esp hidden
- RBH retrobulbar Hg
- Infection

Second assess

- **Type**
 - Open or closed
- **Severity**
 - VA
 - RAPD
 - Extent

Work up of open globe injury

Management must be individualized

A) history: (As usual paying attention to:)

- Object
- Time
- Last meal
- Tetanus status
- Pre-injury VA
- Other eye status

The principles of management are to assess severity of injury, exclude IOFB & infection, restore globe integrity & manage 2ry injuries.

Examination:

- Principles:
 - Gentle- avoid pressing
 - Extent of damage
 - Partial or full thickness
 - Uveal prolapse
 - Lens damage
- Document: Draw
- Detect associated injuries
- Exclude IOFB
- Other eye status

Explain...

- NPO**
- Admission**

ABIO

INV:

- CT scan,
- routine preop.

TTT:

- Surgery
 - Consent
 - GA why?
 - Technique?..... Layers

Levels of management

Operative:

- Restore integrity by surgical closure of the wound
- Minimal distortion of the globe anatomy
- 1ry repair is 1ry repair unless ...lens matter

Post operative:

- Prevent infection
- FU for:
 - Wound
 - Complications: e.g.
 - Angle recession
 - Sedirosis
 - SO palsy
 - delayed events & ttt

Levels of management

1. Anatomical integrity
2. Media clearance.. VH, cataract
3. FB removal
4. Prophylaxis against breaks & RD
5. FU for siderosis & SO palsy

Intraocular foreign body (IOFB)

Iron:

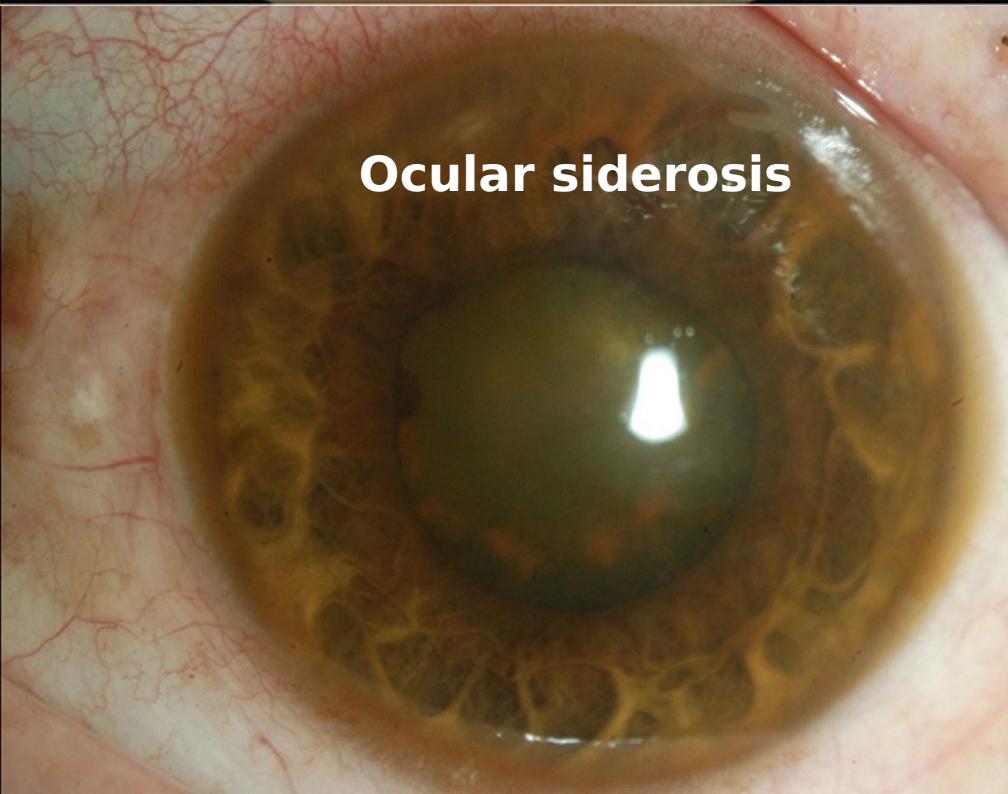
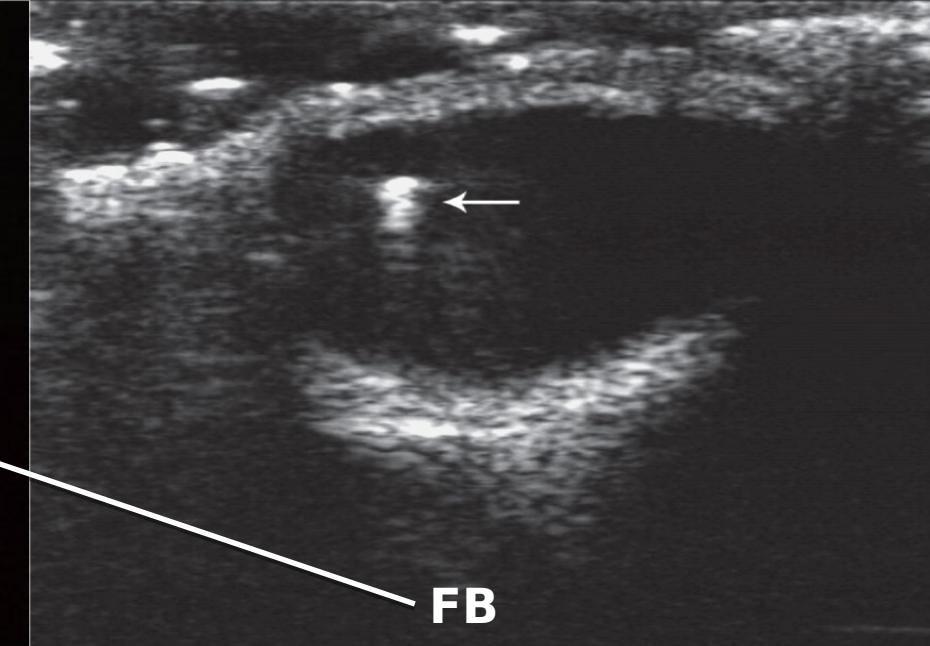
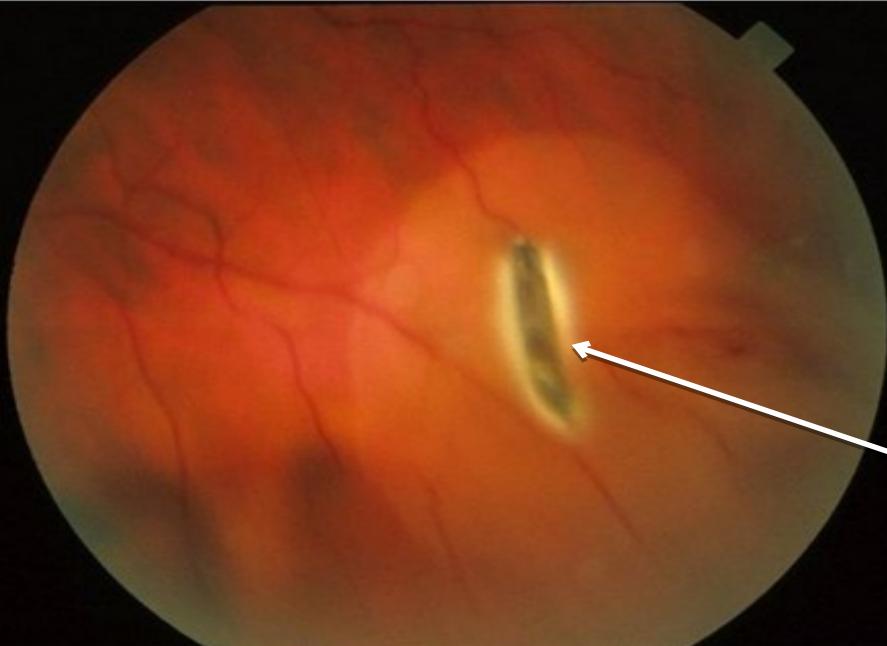
- FB (Siderosis) occurs months later with rusty discoloration of the iris and lens, secondary glaucoma, night blindness, retinal pigmentary changes and low ERG
- Infection is rare (heat generation)
- X-ray is done or ultrasound. CT scan is also useful
- **MRI** is **CONTRAINDICATED** if IOFB is SUSPECTED
- FB is removed by **vitrectomy**

Copper (chalcosis):

acute stage picture of **sterile endophthalmitis**, later blue-green stain of ocular tissues

Glass:

inert, small pieces can be **left inside the eye** if hard to remove



Removal of IOFB

- Removal of IOFB indicated if **injury is acute** (e.g. 24-48 hours)
- If patient present much later (e.g. 7 days) removal is indicated if:
 - Endophthalmitis is present
 - IOFB is toxic or organic
 - Associated VH
 - Impacted onto the retina
 - 2ry surgery is being considered (e.g. RD surgery)
- Otherwise can consider **leaving IOFB in situ**



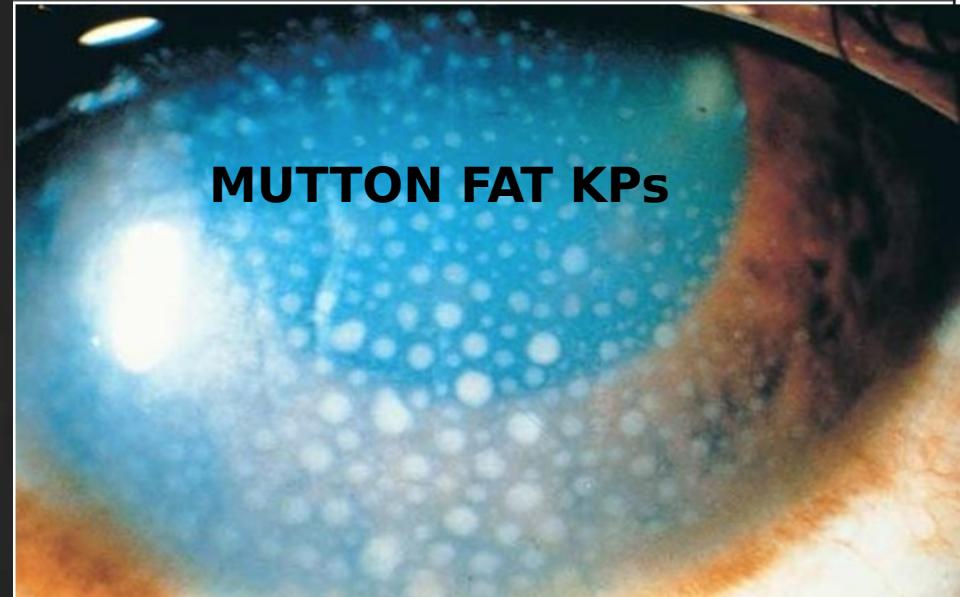
Sympathetic ophthalmia:

- an autoimmune disorder that results following physical or surgical trauma.
- Sequestered uveal antigens are released into the circulation followed by the development of autoantibodies.
- The autoantibodies attack the uveal tissue in both eyes resulting in **bilateral** chronic granulomatous uveitis.
- Sympathetic ophthalmia can be prevented by **enucleation of severely injured eyes** of no hope to repair.
- **Steroids/immunosuppressors** are the treatment for established sympathetic ophthalmia.

Sympathizing eye



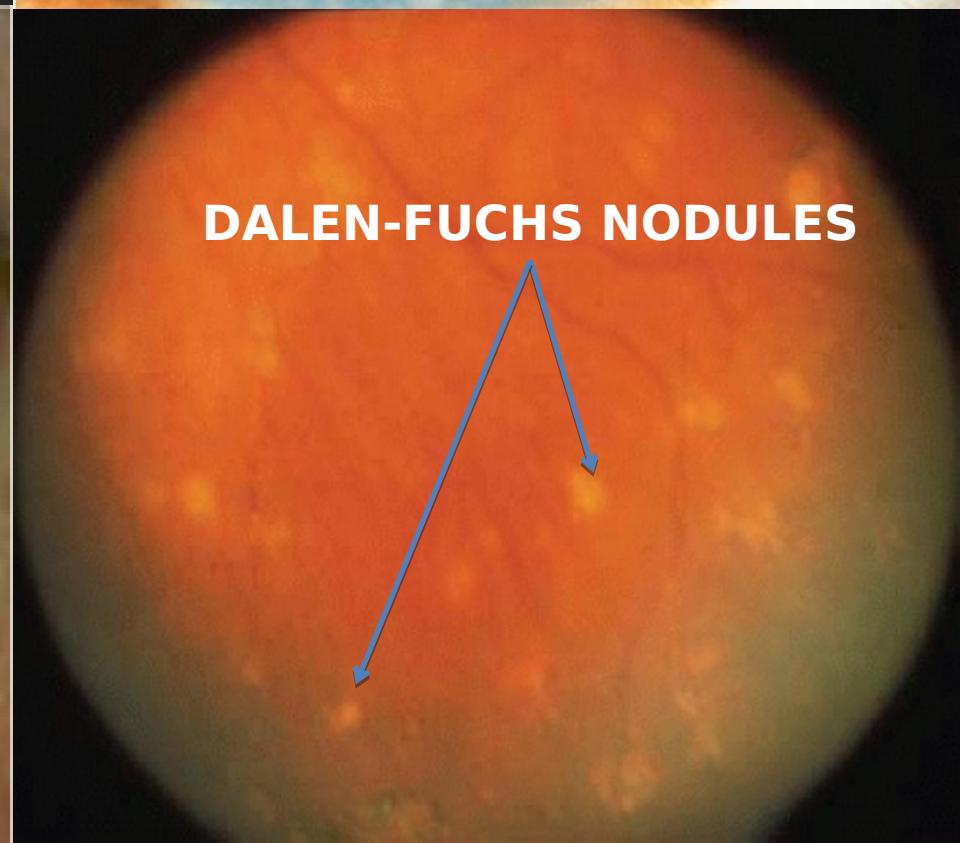
MUTTON FAT KPs



END-STAGE SYMPATHETIC
OPHTHALMIA



DALEN-FUCHS NODULES

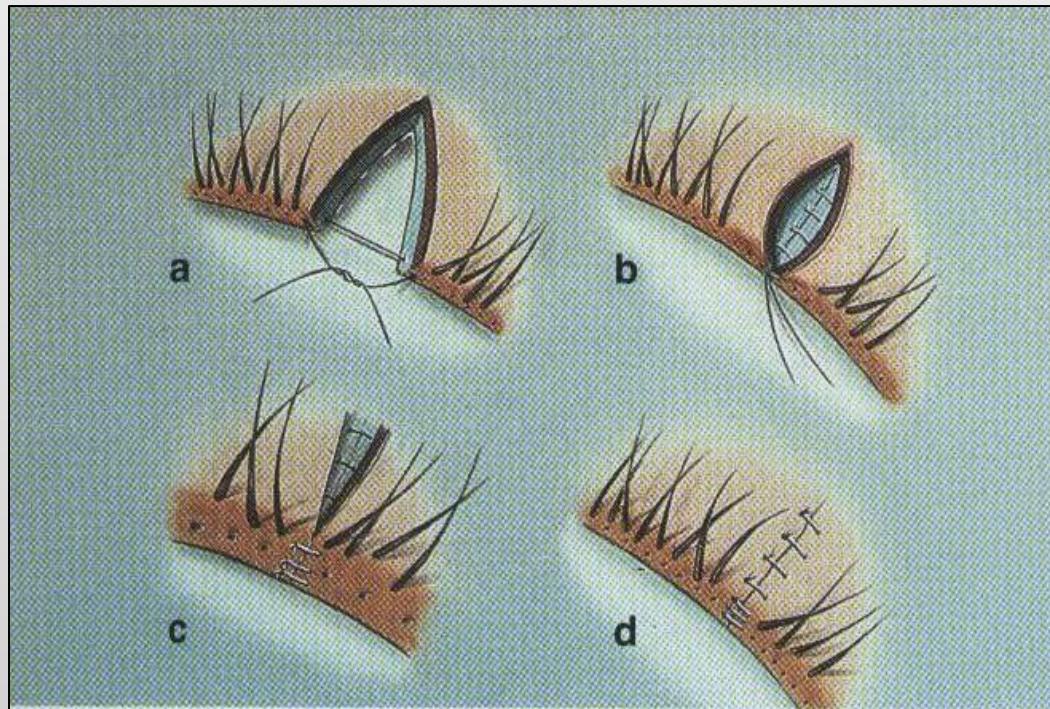


Eye lid laceration



Eye lid laceration

6-0 vicryl
6-0 black







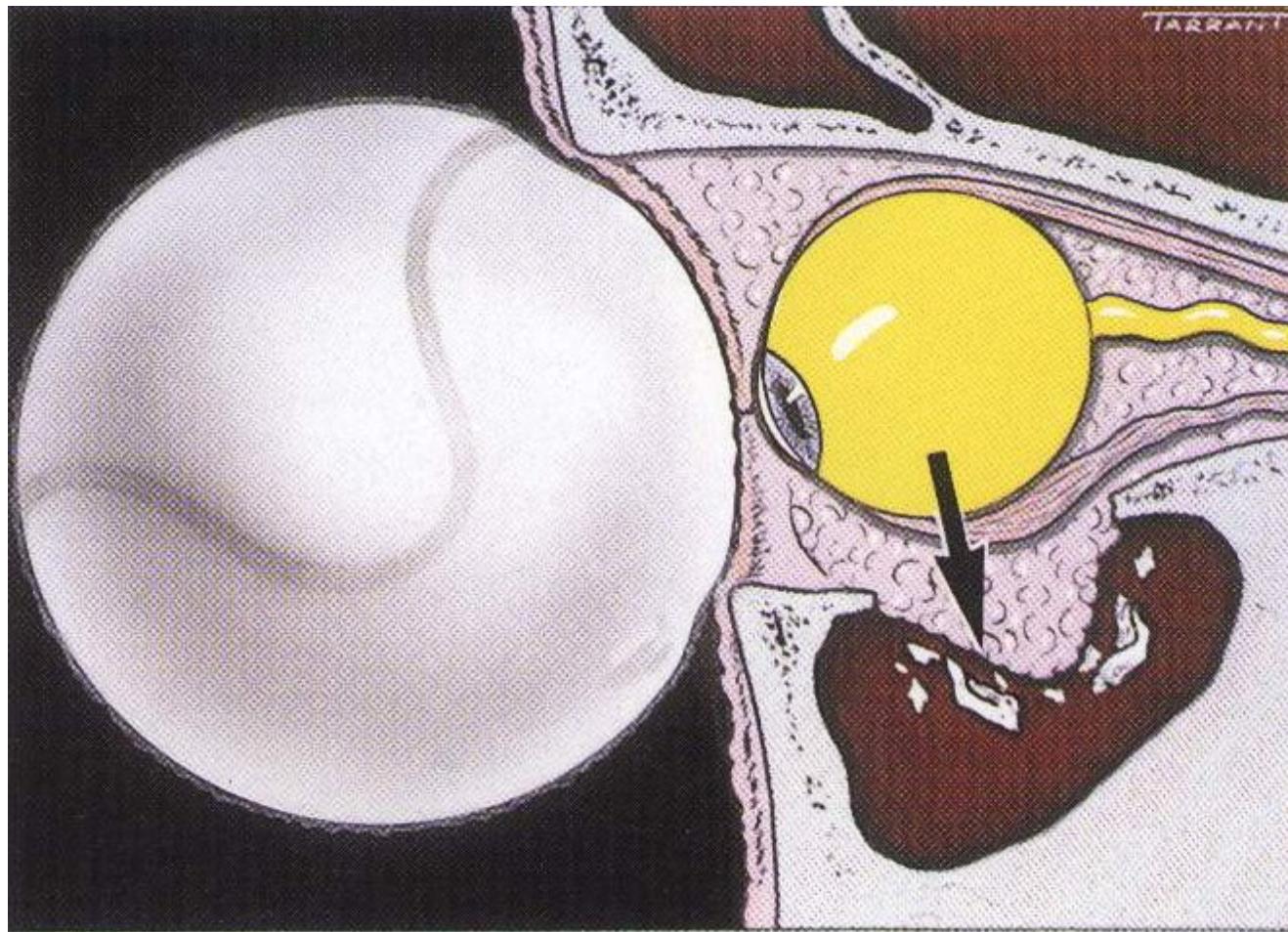


Tear Drop sign

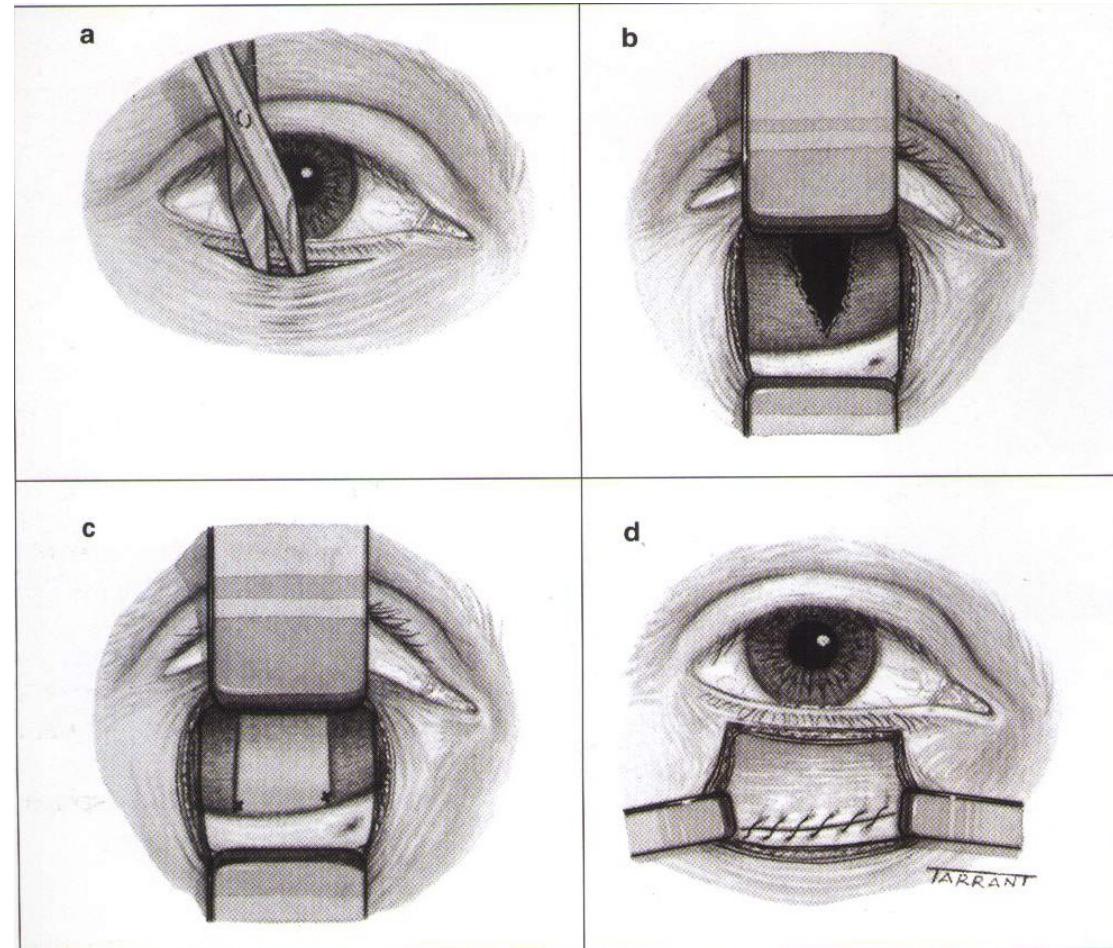


Right orbital floor blow out
fracture

Mechanism of blow out orbital floor



Surgical ttt of orbital floor blow out fracture



Blow out

Exclude:

..... diplopia

Examination:

- VA
- SLE
- FDT
- Diff. IOP
- Motility
- Fundus
- Palpation
- Sensation on infra-orbital n

Inv:

- X-ray (Water's view)
- CT coronal 1 mm cuts...**tear drop sign**
- Hess

TTT:

- Conservative
- Surgical.. When?
- Early surgery ?

الحمد لله

